

On Quantum (Dis)Entanglement in the Anthropocene:

Wondering with a Quantum Mode of Queer Feminist Science Studies as an Exploration
of our Current Climatological Moment

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"interdisciplinarity is risk, but how else are new things going to be nurtured?"

- Donna Haraway¹

i. introduction:

Over the past three centuries, we have witnessed a terrifying escalation of the impact of humans on the global environment/climate. In this current moment, in particular, these climatological impacts are astoundingly evident; to name a few examples of our current state of precarity, we have reached levels of atmospheric carbon dioxide of over 400 parts per million², can expect a global warming of up to 5.8°C during this century³, and are witnessing biodiversity loss at rates 100 times higher than what they would be without human interference⁴. In response to this unprecedented age of climatological devastation, scientists and theorists alike have come to call this new geological epoch (defined by anthropogenic -- human-caused -- climate change) the Anthropocene⁵. The Anthropocene acts as a powerful illustration of the impact that mainstream western discourses have had on the planet at large. Indeed, theoretically, the anthropocene⁶ has ripped a bandage off and revealed the detrimental disposition of our current modes of existence, theorizing, etc. In the wake of such precarity, new methods of understanding, deconstructing, etc. are crucial to

¹ (Haraway, How Like a Leaf 2000)

² (Kahn 2016)

³ (Crutzen 2002)

⁴ (Ceballos, et al. 2015)

⁵ (Crutzen 2002)

⁶ As a note, from this point forward I will no longer be capitalizing "anthropocene" due to both stylistic preferences and a feeble attempt to act against the constant need to capitalize human-centric language.

reconstructing modes of Becoming within our global ecology. This is where much of our current literature and theory regarding existing in the anthropocene falls just a little bit short; due to the implicit classical foundation of most theory, we have continued to disentangle Human from Nature. In searching for modes of theory, science, etc. that work to actively deconstruct discourses of binary, anti-blackness, capitalism, etc., I have been deeply excited by the vast realm of Queer Feminist Science Studies (QFSS) as a basis for a more entangled, active, and disrupting theory and praxis in our current moment. Part of what makes the notions of QFSS so powerful is its active consideration and de-construction of what science "is" and can be; "a queer feminist science studies must concern itself with the quotidian practices of meaning making that trouble, disrupt, and reconfigure assumptions about nature, difference, species and worldliness"⁷. In the context of QFSS and our current ecological moment, I am, in particular, interested in looking at how the enactment of a queer feminist *quantum* theory might be a helpful framework for digging into how we have arrived where we are and how to consider modes of resistance, growth, and re-entanglement. It is crucial for me to note that, for the most part, what quantum theory elucidates about inter/intra-action, entanglement, Being/Becoming, community, etc. is not in any way *new*. Instead, the enactment of quantum theory outside the realm of "traditional" science seems to be powerful in its ability to showcase the sorts of work indigenous peoples, "fringe" academic theorists, grass-roots organizers, etc. have been and continue to do. As a mode of queer, feminist science studies, the enactment of the quantum might be a powerful way to help re-

⁷ (Queer Feminist Science Studies, 5)

shape and re-center science (and academia more broadly) as more entangled, critical, wholistic -- "to open up the word, concept, and practice of 'science' to new, unexpected, and surprising definitions, inhabitations, and hauntings"⁸. Indeed, to bring together notions of quantum and QFSS is an easy and fruitful sort of connection; in many ways, their notions of existence align, and, as has been noted, these alignments provide a very interesting opportunity to loop current scientific modes into the ways of QFSS. In particular, a queer enactment of quantum (dis)entanglement seems to be a powerful mode of exploration moving "forward" in our current climatological moment. Generally, this paper will work toward two main goals: 1) to explore the practices and discourses that have acted as means of dis-entanglement of human from nature⁹ and how this dis-entanglement has put us in the current climatological moment and, 2) to investigate, in both theory and praxis, both current and potential methods/modes of re-entanglement as response to the crisis we find ourselves in.

ii. what is (dis)entanglement?

As always, to understand the undoing of something we must have an understanding of that original "something". In this case, it is crucial to understand what quantum entanglement is and how it relates to what we call "nature". In quantum physics, entanglement is used to describe the phenomenon of how pairs or groups of particles cannot be described independently of the state of the others, no matter the

⁸ (Queer Feminist Science Studies, 6)

⁹ This dis-entanglement is purely one of human perception; the focus of this paper is not an *actual* dis-entanglement (as such a thing is impossible), but rather the understanding of human and nature as separate entities from the human perspective.

physical proximity or lack thereof. Indeed, entanglement moves beyond just an *intertwined* understanding of two separate objects, and instead questions "the very nature of two-ness, and ultimately of one-ness as well. Duality, unity, multiplicity, being are undone. 'Between' will never be the same. One is too few, two is too many."¹⁰. Entanglement indicates a lack of separability, and deems current language and understandings of distinction, or lack thereof, lacking. Enacting dis-entanglement in this context can be understood as in some ways related to the conception of disenchantment put forth by Berman, which, likewise, makes claims about the modern scientific revolution's role in what he calls the disenchantment of the world; "the hallmark of modern consciousness is that it recognizes no element of mind in the so-called inert objects that surround us. The whole materialist position, in fact, assumes the existence of a world 'out there' independent of human thought, which is 'in here'"¹¹. In our case, instead of focusing on chaos as magic, we are leaning into the quantum realm to help round out our picture. Nonetheless, in the context of "nature" and "human", an understanding of entanglement manifests as, put too simply, indeterminacy of distinction or boundary "between" anything, be it cell, leaf, person, animal, rock, or water droplet. (Dis)entanglement, then, is a prominent feature of our current understandings of "Nature" by the very fact that it has been defined as such. Indeed, "If

¹⁰ (Barad, Quantum Entanglements and Huantological Relations of Inheritance: Dis/Continuities, SpaceTime Enfoldings, and Justice-to-Come 2010)

¹¹ (Berman 1981); Berman's account of disenchantment also, in its critique of western science, etc. does not entirely account for the impacts of disenchantment politically, whereas this account necessitates an understanding of harmful discourses and power structures as being a part of the modes of dis-entanglement we explore.

we step back to consider the cosmological and temporal foundations of the Anthropocene, we find that it relies fundamentally on the establishing of fixed origins and future catastrophic ends...a basic requirement of the Anthropocene is to identify some type of beginning boundary, marker, point, or transition at which anthropos catalyzes its new epoch"¹². If we consider our current "moment"¹³, the dis-entanglement of "Nature" and human is evident in our everyday language; even within environmentalist spheres language is often centered around how to "enact" change "on" the environment, thereby reiterating a synthetic separateness of Human from the rest of the planet at-large. The notion of *anthropos* and, thereby the anthropocene, continues to center humanity and human life as separate and above the rest of the swirling of Becoming of particles, plants, and everything else¹⁴. This is an illustration of the active dis-entanglement of human from nature, despite the actual inseparability (entanglement) of existence. Per Hamilton, "rather than protecting itself from physical threats in an external world, humanity now subsumes that world by making itself the simultaneous subject/object of security... With the catastrophic prognoses for the Anthropocene's future making humanity's temporal, ontological, and epistemological essence uncertain, a paradox forms: an existential discontinuity, in which humanity must secure itself in the future from itself in the present"¹⁵. The concept of quantum dis-

¹² (Hamilton, Foucault's End of History: The Temporality of Governmentality and its End in the Anthropocene 2018)

¹³ As a general note, this paper contains temporal language for ease of understanding, despite its being more generally incompatible with the goals of re-entanglement. There is still work to be done in striking a balance of accessibility of text and re-entanglement practices within academic literature.

¹⁴ (Hamilton, 2018)

¹⁵ (Hamilton 2017)

entanglement provides a powerful framework for (re)understanding how we have ended up in this current space of contradictory precarity and acts a powerful starting point for understanding why and how we are here, and how to move "forward".

iii. how dis-entanglement came to 'Be'

The question that must, now, be considered is what sorts of discourses, practices, etc. have contributed to this artificial dis-entanglement in the context of "nature". Considering that dis-entanglement is not a "natural" or inherent state of existence, it is crucial to explore the components that have put us in this moment if we are to have any chance of undoing, or at least lessening, future impacts of the dis-entanglement¹⁶. There are a variety of western, capitalist, imperialist discourses that can be recognized as major dis-entanglers. This paper will focus on discourses of binary/boundary, subject/object distinction, linear temporality/progress, and individual agency.

a. binary/boundary

As touched upon in the prior section, the Anthropocene necessitates a separation between human and nature, a formation of a sort of binary or boundary between the two. This dualism is a key discourse of western colonialism; and, following from this, we can understand how the western model of human/nature relations sprouted from the same dualist, binary properties of western colonialism. By looking at examples of oppression (via race, gender, and colonialism) we can better understand

¹⁶ Recall Berman (1981); "most visibly since the Industrial Revolution, the West has been in a perpetual crisis, an unstable society in a state of extreme alarm. Thus, modern schismatic consciousness is regarded as normal, but the times have not been "normal" for centuries."

the "logic" of colonization and apply similar understandings of oppression and dualism to the western Othering of "Nature". The construction of binary is keystone in most every form of western logic, exploitation, etc. and the understanding of the human/nature binary can only be understood in dependence of other "interrelated and mutually reinforcing dualisms which permeate western culture"¹⁷. For most any oppressed group, we can find at least one binary pair of words used to reiterate the separation and exploitation; Plumwood (1993) compiled a basic list that helps to illustrate this point:

culture	/	nature
reason	/	nature
male	/	female
mind	/	body (nature)
master	/	slave
reason	/	matter (physicality)
rationality	/	animality (nature)
reason	/	emotion (nature)
mind, spirit	/	nature
freedom	/	necessity (nature)
universal	/	particular
human	/	nature (non-human)
civilised	/	primitive (nature)
production	/	reproduction (nature)
public	/	private
subject	/	object
self	/	other

Of course, this is not a complete list, but it acts as a potent illustration of the discourses of dualism that reflect major forms of western oppression. In particular, "the dualisms of male/female, mental/manual (mind/body), civilized/primitive, human/ nature correspond directly to and naturalize gender, class, race and nature oppressions respectively, although a number of others are indirectly involved"¹⁸. Just as creating a binary of primitive and civilized allowed Western imperialists a "reasoning" for their genocides, developing a boundary between human and nature (a dis-entanglement) allows for an

¹⁷ (Plumwood 1993)

¹⁸ (Plumwood 1993)

ease of exploitation without consideration of the impacts on the Other (in this case, "nature").

Along with the binary of human and nature, the western distinction between reason and nature is, perhaps, the dualism that allowed for the development of feelings of superiority within the multitude of binaries being constantly reiterated. If we look at the fissure that runs between the many dualisms/binaries we have noted, most everything on the "superior" side can be represented as a form of 'reason', while those that form the generalized "Other" can all be understood as forms of 'nature'. This connection between othered groups and nature indicates a deeper separation from and disdain of the notion nature or the natural; it indicates the sort of power dynamic of the western world's need to enact *upon* nature and be *above* it. As such, we see that the Western understanding of the world has been formed on a foundation of boundary, division, and, thus, disentanglement. Not dissimilarly, the western scientific canon has made an explicit distinction between what is of the quantum realm, while leaving everything else to exist within the assumptions of classical physics. This is the root of the new "quantum revolution", which is based upon the argument that "human beings and therefore social life exhibit quantum coherence -- in effect, that we are walking wave functions" and that, as such, we ought to be re-reading our very existence "through the quantum"¹⁹. As such, understandings of binary, boundary and dualism as a western de-entanglement continues to prove to be a useful "framework" for understanding how we have arrived in this moment.

¹⁹ (Wendt 2015)

b. the subject/object divide

Following from the discussion of boundary and division in western discourses, as well as in classical physics, it is crucial to look at one of the largest underpinnings of the classical worldview (and thus of western science, etc.): the categorical distinction between subject and object. This distinction, which "places human beings in a spectator relationship to nature", is deemed as necessary or "reasonable" because it allows for a sort of "objectivation". By constructing a boundary between subjects (that to which objects appear, appeared, etc.), western science is able to claim a sense of "objectivity" via separation from that which they are observing. This separation is deemed necessary for good reason and science because without it we risk a "contamination" via our own subjectivity or interference; "it is only by taking the mind *out* of nature that the world can be constituted as an object"²⁰. The paradox this suggests, because observers are simultaneously necessary for and separate from observation, is accepted and addressed as benign in the classical worldview. In fact, it is praised and attached to the sorts of superior modes of knowledge suggested in the previous section. However, this paradox becomes more of a problem when we consider a quantum mechanical understanding of our observations, interactions, etc. Within quantum physics, the problem of subjectivity is attached to the "measurement problem", because of the impossibility of objective measurement within quantum systems. Prior to observation, quantum systems exist only as potentialities and, after measurement, are actualities. As

²⁰ (Wendt 2015)

such, we can make no assumption about an independence between subject and object, and, instead, are introduced to the sort of entangled, relational model we exist within.

In the context of the Anthropocene, the subject/object distinction drives home how our understandings of ourselves as separate, objective observers taints our interactions with the world at large. The enactment of a subject/object distinction is a basis for other discourses of binary and, thus, leads to more potent harm-doing against whatever is deemed Other. Quantum understandings, then, "undermine the notion of an inherent fixed (apparatus-independent, Cartesian) subject- object distinction...There are no separately determinate individual entities that *interact* with one another; rather, the co-constitution of determinately bounded and propertied entities results from specific *intra-actions*"²¹.

c. agency and the agential subject

From the development of the subject/object distinction emerges the idea of agency or the agent. Within western (generally capitalist) discourse, the concept of agency is crucial to exploitation, etc. and is generally understood as "the assumption that the individual authors his own life, or that "the agential subject" is, indeed, an autonomous individual whose decisions are properly her own"²². As such, we are introduced to the idea of the "agential subject" - the subject (versus object) who *has* agency²³. This understanding of agency allows for a development of the individual as a

²¹ (Barad 2010)

²² (Kirby, *Originary Humanicity: Locating Anthropos*, 2018)

²³ (Kirby, *Originary Humanicity*); "the common perception of the agential subject goes something like this: a subject-self can exert power over an object-self who, or is it which, appears powerless."

solitary, self-controlled unit, which bodes well for western, capitalist practices. As humans are made to think of themselves as the self-autonomous units who are the maker of their own circumstances, they become unaware of how they might be controlled, forced into situations, etc. The pseudo-self-awareness of the western *Cogito* "as synonymous with the capacity to know and to realize an intention—something of which the body/nature is presumably incapable" works as method to further dis-entangle human from nature, leading to the sort of alienation that has made environmental exploitation feel almost natural, for lack of a better word. Likewise, this dis-entanglement has become a well-worn path for the continued alienation of the "individual"²⁴ and a continued reiteration of the western notion of the agential subject. Despite the actual erosion of the agential subject²⁵, the perception of the agential subject has a strong hold on *anthropos* and it is, indeed, an indicator of the birthplace of the "anthropological as exception"²⁶. As such, the paradox of agency in the anthropocene appears as we (as supposed individuals agential subjects) are forced to view what "we" have done, but simultaneously have no clue as to how to acknowledge it, let alone combat it; As Bruno Latour writes, "people are not equipped with the mental and emotional repertoire to deal with such a vast scale of events; that they have difficulty submitting to such a rapid acceleration for which, in addition, they are supposed to feel responsible while, in the meantime, this call for action has none of the traits of their older revolutionary dreams.

²⁴ Tsing, page 138.

²⁵ (Kirby, Humanicity); "within certain areas of Western academic thinking, especially over the last forty years... that "the agential subject" is, indeed, an autonomous individual whose decisions are properly her own, is significantly compromised"

²⁶ (Kirby, Humanicity)

How can we simultaneously be part of such a long history, have such an important influence, and yet be so late in realizing what has happened and so utterly impotent in our attempts to fix it?"²⁷.

d. linearity, temporality, and progress

The "exceptionalism" of humanity is, similarly, tied to a very specific notion of "progress" under a rigid temporal framework. The notion of an "individual's" success is tied to their ability to continually *progress* in the ways expected under western capitalist notions of 'productivity'. As a matter of fact, "most of us were raised on dreams of modernization and progress. These frames sort out those parts of the present that might lead to the future. The rest are trivial; they "drop out" of history. I imagine you talking back: 'Progress? That's an idea from the nineteenth century.' The term 'progress,' referring to a general state, has become rare; even twentieth-century modernization has begun to feel archaic. But their categories and assumptions of improvement are with us everywhere"²⁸. Indeed, this conception of progress is embedded in the aforementioned concept of the subject and, thus, leads to a rigid temporal linearity in which the focus is, essentially, accomplish A to move to B to move to C to move to.... and on and on until death in which case another individual subject picks up Q and moves to R. Of course, this engrainment of progress has only fueled the desensitized destruction of the surrounding environment (cue the anthropocene). A "productive" "progress" relies upon a linear, disjoint sort of temporality, such that progress, etc. can be distinctly measured for further compensation, exploitation, etc. In tandem, "the conceptual foundation of the

²⁷ (Latour 2014)

²⁸ (Tsing 2015)

Anthropocene depends upon the measurement and recognition of discrete units of time that must be placed in a temporally linear sequence in relation to the golden spike of anthropos, the human. Regardless of its planetary politics, the Anthropocene revolves around a series of technical and evidential questions about how to determine the boundary of a distinct 'human' controlled geological time unit"²⁹. As such, this sort of temporality necessitates the sort of boundary that evidences dis-entanglement. The question, then, becomes how to approach the dis-entanglement (as surveyed above) of human from nature. Namely, what is the move (not)forward to re-entangle?

iv. exploring modes of re-entanglement

a. re-entanglement within academia

As explored in the prior section, specific notions of temporality and linearity are remnants of western, capitalist forms of discourse that have pushed us to the point of climatological precarity we exist at now. In the realm of academia and theory, embracing (a)temporality can act as a powerful means of theoretical disentanglement. For instance, looking at Scott Hamilton's work on temporality, governance, and Foucault, there is (a)temporal work being done in the focus on how notions of temporality have changed, and how temporality is engaged in past works. The piece places notions of temporality at the center of the work, exploring how temporality interacts with the works of Foucault (despite a lack of explicit mention of it) and how we

²⁹ (Hamilton, Securing Ourselves from Ourselves? The Paradox of 'Entanglement' in the Anthropocene 2017)

can enact Foucauldian principles in such a way that they acknowledge temporality as a key component of notions of governance, etc.:

"This article has argued that political temporality is an essential component of Foucault's concept of governmentality. Strangely, International Relations (IR) and the social sciences have overlooked Foucault's many discussions of time in the Security, Territory, Population (STP) lectures, gravitating instead towards topics such as society, liberalism, and the population. This article has attempted to remedy this omission by providing a close inspection of STP, thereby revealing how the governmentalization of the state occurred through a fundamental cosmological and temporal transformation – a 'de-governmentalization of the cosmos' – that moved pastoral power from the closed linear temporality of Christian eschatology, into an open historicity with- out end, facilitating what Foucault repeatedly describes as the 'indefinite governmentality' of the state"³⁰.

In re-centering the notion and critique of temporality in Foucault's work, Hamilton begins a sort of process of de-entanglement via (a)temporality and, likewise, creates a new means by which to critique temporality and other forces at play with it via the use of foundational academic texts. This revitalization of works already in the academic canon via a lens of (a)temporality is a profound method of de-entanglement because of the fact that it can be absorbed and accepted in the context of academia. This sort of re-molding of canonical texts allows for a deeper re-worming and re-understanding of the

³⁰ (Hamilton, Foucault's End of History: The Temporality of Governmentality and its End in the Anthropocene 2018)

implications of theory and, thus, makes us "able to take a new perspective on the implications of the Anthropocene epoch".

Karen Barad's body of work also centers temporality in its content, but, even more profound is her alteration of the style of writing that she produces for academia. She changes the style in an attempt to make it such that "The reader is invited to participate in a performance of spacetime (re)configurings that are more akin to how electrons experience the world than any journey narrated through rhetorical forms that presume actors move along trajectories across a stage of spacetime (often called history)"³¹. Barad enacts by undoing the traditional format of an academic paper, creating long strings of phrases connected by "/" as opposed to created sentences that are meant to temporally follow one another. Likewise, a paper might not have sections, but instead "acts" and, there is a sort of flow between writing that recalls a more "normal" (temporal) style of academic writing and writing that has a more narrative, free-style sort of approach. For instance, it is near impossible to pick out a short excerpt of the piece just cited because many of the page long "sections" have only a single period at the very, very end. The piece weaves between almost poetic strings of phrases (leaping from one "time" to another without any sort of chronology), narrative conversations between, for instance, Bohr and Heisenberg, and quite dense theoretical blurbs. The style is, at first, abrasive to its reader, as it is not in line with what is expected of an academic piece. However, it is the illegibility and abrasiveness of it that is so powerful,

³¹ (Barad, Quantum Entanglements and Huantological Relations of Inheritance: Dis/Continuities, SpaceTime Enfoldings, and Justice-to-Come 2010)

as it is a visual, stylistic critique of the temporal, linear basis of western understandings of knowledge, etc. Barad writes:

" Time is out of joint. Dispersed. Diffracted. Time is diffracted through itself.

It is not only the nature of time in its disjointedness that is at stake, but also disjointedness itself. Indeed, the nature of 'dis' and 'jointedness', of discontinuity and continuity, of difference and entanglement, and their im/possible interrelationships are at issue.

This paper is about joins and disjoins—cutting together/apart—not separate consecutive activities, but a single event that is not one. Intra- action, not interaction."³²

And, in writing so, she ensures that there is no disagreement between the goals of the piece and its style. Indeed, there is no way to call Barad a hypocrite -- as she practices what she preaches via the style of her own sermon.

However, Barad's stylistic (a)temporality provides some worrisome challenges; namely, because of its newness and overt over-complexity, it lacks an accessibility that seems necessary to good, and properly inclusive academic literature (considering the sort of western ivory tower that academia tends to exist within). Nonetheless, the move to un-do temporality and re-entangle has the potential to become a major tool moving "forward" if we take the philosophy behind Barad's altered writing style and consider more accessible, legible formats that still fully express a notion of atemporality. As such, if a larger group of academia were to, in the name of (a)temporality as mode of

³² (Barad, *Troubling Time/s and Ecologies of Nothingness: Re-Turning, Re-membering, and Facing the Incalculable* 2018)

theoretical re-entanglement, develop and embrace some new particle-modeled style³³, there exists a larger chance of re-entanglement and alteration of *how* we think about theory in such a way that would be beneficial to the goal of re-entangle as a means of existing within the anthropocene.

More broadly, as referenced prior, there are quite a few underlying discourses that have created the environment for the dis-entanglement that has led to the emergence of our current climatological moment. As such, by actively working to discover, critique, and re-do the sorts of assumptions made by colonialism, racism, binary gender, etc. we are doing a sort of re-entanglement. By enacting, essentially, intersectionality in hand with a deconstructive lens, most any subject of academia can begin to be re-entangled, via the undoing of the many discourses that are a part of the larger schema of western dis-entanglement. This is, in a way, the project of QFSS; by working to understand and deconstruct current modes of science, etc. we are able to develop new modes of knowledge building that offer a potent approach to re-entanglement.

b. noticing: re-entanglement case studies

Alongside theory and academia, it is crucial to apply such thinking to modes of praxis. The question of how to re-entangle in practice seems daunting at first, until realizing that hesitance is, too, a result of western colonial sorts of socialization. In fact, many other non-western cultures, etc. have always been interacting with the

³³ Perhaps one that invokes its atemporality in a more visual element, as opposed the writing itself?

environment in ways that align smoothly with entanglement. As such, looking to them as examples seems a good place to begin the quest for how to actually exist in the wake of our new sort of precarity. Correspondingly, the following section looks to a wide variety of sources for case studies in how to Be; it acts as a first attempt at wondering with for re-entanglement, by considering the way certain discourses have had material-semiotic impacts, and wondering new, entangled modes of knowledge building, sharing, community growth, tuning, and more. It works at a multitude of scales, in order to embrace a queer, quantum, amoebic understanding of parallel and connectedness, and to fuzzy the notion of boundary implicated in scale.

a. the (im)modest witness

The terms “immodest witness” and “modest witness” emerge from gendered understandings of objectivity and subjectivity - specifically in the realm of the “rational” sciences. To better understand the terms, it is perhaps best to begin with the notion of a modest witness” and how this arose from equating masculinity with “rationality” and “objectivity”. As Solomon accounts, “While the early Cartesians staked a ground for rationality and objectivity in science, workers...continued to mark that ground as masculine. Boyle argued for a ‘modest’ form of authority based on objective observations of nature. The ‘modesty’ of the scientific witness was that of an observer who had the capacity to render himself ‘invisible’ from analysis”³⁴. Thus, the “modest witness” is a masculine understanding of the scientific observer as an object-maker that is supposedly totally separate from the object being studied. Likewise, the “modest

³⁴ (Soloman, 85-101)

witness” supposed objectivity is masculinized in direct contrast to the feminization of irrationality and subjectivity, thereby “establishing a methodological standard for ‘modest witnessing’ of experimental phenomena as an ‘unqueering’ or masculinization of science” ³⁵. It is crucial to not that even the term “modest” is being enacted in a gendered way, as modesty was perceived as feminine and, then, repackaged for Boyle’s masculine rationality. Solomon explores this in the context of Harry Harlow’s “monster mothers” monkey experiment, showing how the veil of supposed objectivity as a “modest witness” was, in fact, deeply engendered, politicized, and, thus, totally subjective; “Harry Harlow’s finding that affection is necessary for healthy child development worked to grant children the privilege to receive affection from parents and parental institutions; it also asserted the superiority of the nuclear kinship structure of white American families” ³⁶.

Michelle Murphy proposes the term “immodest witness” in contrast to that of the “modest witness”, specifically looking at the vaginal self-exam to understand the way in which the “immodest witness” reconfigures the interactions of the subject with “objectivity”. The vaginal self-exam places an individual in the position of being both the subject and the object, thereby illustrating a resistant “oppositional yet entangled subject-figure, incited into being not only in images, but also in practices, bodies, and affects” ³⁷. By calling this subject-object who actively engages in both subject-making and object-making an “immodest witness”, Murphy emphasizes the way in which the

³⁵ (Solomon, 91)

³⁶ (Solomon 99)

³⁷ (Murphy 2017, 177-191).

scientist-subject is implicated in their study, thereby emphasizing the importance and necessity of the subject in knowledge making, and “challenging notions of ... modesty that prevented women...from even marking the subject-figure of science as sexed”³⁸.

As such, the notion of the “immodest witness” seems a prominent mode of re-entanglement via an undoing of binary discourses, specifically that of the subject object divide; it, like the practice of self-examination, re-centers the inherent sensuality, embodied and subjective nature of the subject as observer, thereby denying the notions of “modesty”, “objectivity”, etc. as a part of what science is and ought to be.

Considering the case of the immodest witness in the context of modes of being, knowledge building, existing, etc. in the anthropocene, it seems to suggest a sort of immodest mode of interacting with the "natural" world in which we actively acknowledge not only our own subjectivity, but all other subjectivities and their embodied sort of connection. Potential ways of enacting this sort of entangled mode of being both object and subject in the context of our environmental precarity might involve new structures and modes of housing, living, and community that interact with and interrogate commutatively with their surroundings; we might imagine these as spaces of entangled, immodest growing. This might manifest in ways similar to some existing eco-living models called eco villages, or, at a smaller, more proximal scale, as community gardens. For instance, in her book, *Ecovillages: lessons for sustainable community*, Karen Litfin recounts and theorizes about her journey "around the world in 14 ecovillages"; in coming to understand what living in small scale, environmentally aware

³⁸ (Murphy , 180).

communal spaces can entail, she wrote:

"I gleaned the following convictions that infuse ecovillage culture:

- the mounting ecological crisis is also a crisis of human meaning
- the web of life is sacred, and we are integral members of that web
- we can harmonize our lives with the web if we learn to co-create with nature
- community is an adventure in conscious relational living - ecologically, socially, and psychologically.

At the heart of these convictions lies one simple premise: that we are inseparable from nature -- and the sooner we wake up to this face, the better for everybody"³⁹.

The enactment of the concept of the immodest witness bears much promise in this sort of case of a sort of unity/entanglement. In fact, as this mirrors the sort of notion of being both object and subject, it offers the opportunity for powerful sorts of charged individual self-examination *with* our natural surroundings as a mode of re-entanglement.

b. organic speculative fabulation: slime molds and more

In an attempt to re-entangle knowledge building, community making, etc. so as to make it a process of being-with, looking at organic entities, ecologies, etc. has become a potentially powerful sort of QFSS "case study". Looking at such things through a

³⁹ (Litfin 2014)

quantum framework allows for elucidation into potential modes and understandings of a re-entangled existence. For instance, one organism that possesses some impressive sorts of knowledge is the slime mold; "essentially an undifferentiated sack of multinucleated protoplasm, the cellular slime mold *Dictyostelium discoideum* has no brain, no central nervous system-- and yet, in conditions of scarcity, it will swarm, intelligently reconfiguring itself into multicellular masses, working in tandem temporarily to proliferate, spread, and relocate to more generative sires. The slime mold defies Linnean taxonomization, as it cannot be easily categorized as animal, plant, mineral, or even fungi, leaving contemporary scientists to relegate the hundreds of species of slime molds to kingdom Protists, a kind of catchall kingdom of 'others'"⁴⁰. This makes slime molds a powerful illustration of the short comings of the classical scientific model; "when it comes to queering identity, the social amoeba enjoys multiple indeterminacies, and has managed to hoodwink scientists' ongoing attempts to nail down its taxonomy, its species- being defying not only classification by phylum but also by kingdom"⁴¹. The sort of simultaneous multiplicity and singularity of slime mold does not, likewise, "fit" with a classical scientific mode of thinking. However, the sort of ambiguity of the slime mold lends itself to quantum thought, as the slime mold, in a way, embodies quantum entanglement as: "duality, unity, multiplicity, being are undone. 'Between' will never be the same. One is too few, two is too many"⁴². Likewise, the quantum sort of

⁴⁰ (Bhang 2017)

⁴¹ (Barad, Intra-actions 2012)

⁴² (Barad, Quantum Entanglements and Huantological Relations of Inheritance: Dis/Continuities, SpaceTime Enfoldings, and Justice-to-Come 2010)

simultaneous singularity and plurality of the slime mold provides an interesting and powerful case study for a sort of "speculative fabulation" of a "model of life that could be, rather than life that already is"⁴³. Indeed, the slime mold offers us a helpful move as far as how to interact with and learn from in a way that is not studying, but instead, allows us to begin "to wonder with it, rather than marvel at it from a distance"⁴⁴. This notion of wondering with suggests powerful new ways of framing science, research, learning, and, thus, sort of acts as a potential new framework developing models of collective, communal living, growth in accordance with our surroundings as fellow subjects. And, just as the slime mold reveals a new sort of process of wondering with, it evidences helpful ways of both understanding our own hierarchies, power structures, etc. and look toward new sorts of modes of existence, of communing, etc.; "One can begin to track the narrativization of human exceptionalism in the conventional story of life itself. And because slime molds lead us away from systems of hierarchical ordering, the story of how humans have tried to shoehorn slime into a more familiar form reveals how storytellers of science become susceptible to their own frameworks"⁴⁵.

Indeed, "wondering with" slime molds offers quite a few positive potentialities (given a proper, broader lens of re-entanglement); in particular, its lack of the sort of distinct, individual agent/actor allows for another potential consideration for existing outside of the subject/object divide and outside of the notion of individualist interaction in favor of something like Karen Barad's intra-action. As was explored earlier, "The

⁴³ (Bhang 2017)

⁴⁴ (Bhang 2017)

⁴⁵ (Bhang 2017)

usual notion of interaction assumes that there are individual independently existing entities or agents that preexist their acting upon one another. By contrast, the notion of 'intra-action' queers the familiar sense of causality (where one or more causal agents precede and produce an effect), and more generally unsettles the metaphysics of individualism (the belief that there are individually constituted agents or entities, as well as times and places)" ⁴⁶. In the context of slime molds, "the very question of what is or isn't an "individual" is not a clear and distinct matter...Social amoebas queer the nature of identity, calling into question the individual/group binary"⁴⁷. As such, slime molds refuse the sort of "explanatory model on the basis of individuals interacting with one another and their 'environment'" that scientists have often attempted to force-fit the slime mold into, despite it completely overlooking the basic qualities of the organism. This once again elucidates how powerful communal sorts of modes of action, co-learning, growing, etc. can be wondered with from looking at slime molds, etc. It, indeed, suggests a deeper look into the world of biomimicry, but from a queer, quantum lens.

c. panpsychism and biomimicry

In sooth, an insightful case study that can be helpful as an example of new ways of existing in alignment with a sort of quantum re-entanglement is the interactions of Australian aboriginal folks with "objects" like Old Man Rock -- a part of a key "Dreaming" location. The Aboriginal people know that Old Man Rock "listened to and smelled the

⁴⁶ (Barad, Intra-actions 2012)

⁴⁷ (Barad, Quantum Entanglements and Huantological Relations of Inheritance: Dis/Continuities, SpaceTime Enfoldings, and Justice-to-Come 2010)

sweat of Aboriginal people as they passed by hunting, gathering, camping, or just mucking about "⁴⁸. More broadly, Povinelli explains, "The Dreaming can be understood as the given condition of the human and natural world established in the ancestral past...all matter (human and animal bodies, objects, and environments) is conceived as the congealed labor of ancestral Dreaming beings. While the mythic actions of some dreamtime ancestors were concentrated at certain now-sacred sites, the land is more generally permeated by signs of their present-day intentionality and agency. So, for example, in the region where I work, certain water holes were formed by the travels of Dingo Dreaming, who moved underground, popping up at certain places to perform certain feats. In all the places he came up, he left a water hole. These water holes not only mark what happened in the past, they also show where Dingo remains today"⁴⁹. The Australian Aboriginal people conceive of not some divided notion of human and nature, but rather of a singular holistic entity in which every "part" has the potential for a subjective sort of agency. The ways in which they interact with that which surrounds them illustrates just how dualism is the logic of colonialism (as Plumwood discussed) and suggests that embracing time in "nature", feeling, etc. can be modes of re-entanglement in the sphere of action. Likewise, the experiences of the aboriginal peoples evidences a new way to consider labor and value that undoes the current capitalist, productivity -based temporality of progress. Via western modes of thought, the aboriginal hunter-gatherers have been denied full-citizenship "based partly on the

⁴⁸ (Povinelli 1995)

⁴⁹ (Povinelli 1995)

belief that they had not sufficiently extracted themselves from or productively engaged their environment" and, furthermore, the aboriginal people are seen as not *owning* anything on "the land through which they moved because nothing had been added and because the human subject who could "add to" and "transform" the land had yet to be formed; the land remained "empty" (*term nullius*) of people or, more precisely, "unoccupied" by fully human subjects and the civil nations they were able to create." As such, via the current mode of understanding labor and value, these people provided nothing "valuable or productive", yet, they live full, rounded lives in which they exist at one with that around them, as opposed to seeing their surroundings as something to be exploited and profited upon. Enacting what (as I will next discuss) a sort of quantum panpsychist understanding of the world, and undoing the necessity of constant "Action" for productivity will not only theoretically help the process of re-entanglement, but allows an avenue for individuals and groups to become reacquainted with that which surrounds them, and re-entangle themselves in such a way that they are made aware of the bond they have lost.

This case study leads the way to a larger conversation of panpsychism (per aboriginal groups) and biomimicry as powerful methods of re-entanglement as praxis. Similarly to Povinelli, Freya Mathews spent time with Australian Aboriginal folks to begin to re-learn about herself in relation to the world around her. In interacting with Sun Dew, Mathews came to learn about what is, essentially, the sort of quantum hum of entanglement:

"Sun Dew gazes at me, smiling quietly. So, she says, the choice for humanity is

either to exist isolated as a self-referring particle of sentience in a dead and ruined world or to exist like...she searches for words...a fish in a shoal: by tuning its movements to others, it makes of the entire shoal a sentient thing. This is not merely a choice of worldview, she emphasizes. This is an actual choice of world... She is saying that it is our choice which determines whether or not the world will actually recover its psycho-activity and, indeed, its eternity. When we destroy its coherence we quash its psycho-activity, we snuff out its eternity. On the other hand, if we recreate the coherence, perhaps psycho-activity will be restored. Eternity will open up inside the present again. The hum will recommence"⁵⁰.

Indeed, the choice of re-entanglement is ours to make and it requires a new way of interacting with that around us. It necessitates an understanding of consciousness that includes everything as having consciousness as itself (in which rocks are conscious "as rocks") via a panpsychist understanding. Likewise, this ought to alter the way we interact with the environment via growing, sowing, reaping, etc. If we are to re-entangle with that which surrounds us, it requires a biomimicry of sorts. As western subjects, we have lost the ability to do this on our own, so the best method forward is to accept that so many other parts of "nature" know how to do things and, from there, try to mimic them. But, in the process, we must be careful not to instate our tendencies of western dualism; "under the banner of biocentrism, many ecological philosophers have already tried to re- situate the human inside nature, but their attempts to do so have subtly

⁵⁰ (Mathews 2014)

reinscribed, even while reversing, the old value dualisms"⁵¹. Biomimicry cannot be understood in the sense of some designers, in which they take something from nature for their own design and then leave the thing to rot, but, instead, act as a part of it, and alter how we understand ourselves as in nature as opposed to above it;

"biomimicry will not furnish a key to sustainability until we act not only in imitation of nature but from within, so to speak, the mindset of nature, where this means allowing nature to “re-design” not only our commodities but our own desires. Until we, like all other elements of the ecosystem, weave ourselves into nature’s synergistic net of desire, wanting what our eco-others need us to want, no amount of clever biomimetic design of our products will ensure the integration of those products into nature"⁵².

Via this sort of biomimicry, we have a real chance to enact organization around re-entanglement that could be crucial to existence in the anthropocene. By re-connecting with the soil, the rocks, the water, by putting ourselves directly in those scenarios, we can help catalyze this process because, as evidenced by Sun Dew, the world is our most powerful teacher.

vi. in conclusion...

This exact moment is one that the rest of the world saw coming, but we as western subjects are too separated from to acknowledge until it seems almost too late;

⁵¹ (Mathews, Towards a Deeper Philosophy of Biomimicry 2011)

⁵² (Mathews, Towards a Deeper Philosophy of Biomimicry 2011)

we exist in a state of global precarity, founded upon western classical discourses that center linear understandings of time, power, and existence. Quantum theory (particularly as a putty for QFSS to mold) offers a potentially powerful mode of re-thinking and, thus, re-entangling human with nature. Indeed, via an active, always flowing sort of quantum deconstruction of how we came to be here, we give ourselves the tools as well as the mindset to re-consider how we interact both theoretically and in the “real world”. By actively and continuously undoing the sorts of gendered, racist, etc. binaries/dualism put in place by westernization, we put ourselves in place to be more open to other modes of Being and Becoming, and are more open to learn how to re-entangle ourselves and, hopefully, grow alongside the rest of the world, as opposed to continuing to act “upon it” and ignoring how this is also our own demise. These are not new ideas; they are just a new lens via which to embrace what has been all along. In all, if we can bring humans back down to earth, let them feel wet soil in between their fingers, let them see a plant grow without their interference and understand that as a note to them about the larger power and magnitude of the self-sustaining world we live in, we have a chance to re entangle with it and, thus, reinstate the quantum hum of all things⁵³.

⁵³ subject-objects

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